

Farm Fuel and Ethanol

- Farm gasoline use, at 1.4 billion gallons in 1995, has been steady in recent years, whereas diesel fuel use has been increasing since 1989 and reached 3.6 billion gallons in 1995.
- Farm fuel prices averaged higher in 1995 than in 1994 and are expected to rise even higher in 1996.
- Farm fuel expenditures in 1995 were \$5.74 billion, an increase of 3 percent over 1994. Farm fuel was 3.3 percent of 1995 farm production expenditures.
- Agriculture also supplies fuel as ethanol from corn. In the 1994/95 marketing year, 533 million bushels of corn were used to produce 1.3 billion gallons of ethanol, 16 percent more than in 1993/94.

Farm use of diesel fuel reached 3.6 billion gallons in 1995, and has been increasing every year since 1989. Farm gasoline use, at 1.4 billion gallons in 1995, has been holding steady in recent years. Farm use of LP gas was 0.8 billion gallons in 1995, and has ranged from 0.6 - 0.9 billion gallons over the past decade.

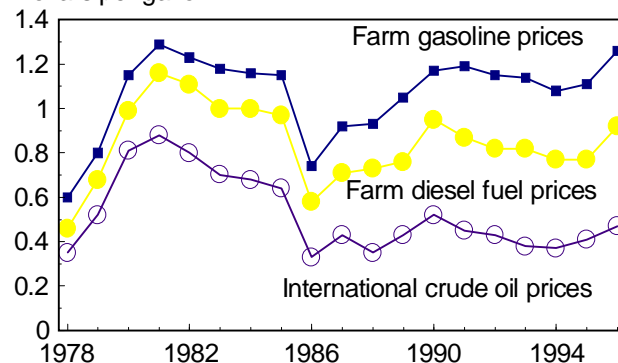
Prices paid by farmers for gasoline, diesel, and LP gas are influenced by imported crude oil. Gasoline prices in 1995 averaged about 3 percent higher than in 1994, and the LP gas price averaged 1 percent higher, due to increased imported crude oil prices. Farm fuel prices in 1996 are expected to average 9-19 percent higher than in 1995 as imported crude oil prices are expected to be up 16 percent. The prices paid index for farm fuels for the first three quarters of 1996 also rose compared with 1995. For 1997, the Department of Energy forecasts an average crude oil price below the 1996 level.

Farm fuel expenditures for 1995 were \$5.74 billion, an increase of 3 percent over 1994, due mostly to higher energy prices. The estimated volume of fuel purchased for farm use in 1995 was similar to 1994. Farm fuel's share of the total farm production expenditures was 3.3 percent in 1995, compared with 3.5 percent in 1994.

The agriculture sector also supplies energy in the form of ethanol, produced mostly from corn. In the 1994/95 marketing year, 533 million bushels of corn were used to produce 1.3 billion gallons of ethanol, an increase of 16 percent over 1993/94 as the oxygen requirements of the

Farm fuel and international crude oil prices, 1974-96

Dollars per gallon



Source: USDA, ERS, based on NASS and U.S. Dept. of Energy data

Clean Air Act Amendments of 1990 (CAA) spurred the market for oxygenates to reduce carbon monoxide emissions during winter months. The CAA also requires the use of oxygenated fuels as part of the reformulated gasoline program for controlling ground level ozone formation. Fuel ethanol production in the 1995/96 marketing year is expected to fall 22 percent from the 1994/95 level, as higher corn prices have made ethanol less profitable. As a result, ethanol-producing companies announced the temporary closing of two ethanol production plants, one in Ohio and one in North Dakota. Ethanol production in 1996/97 is projected to be 8 percent higher than 1995/96, but 16 percent lower than the record high year of 1994/95.

The Department of Energy (DOE) projects total petroleum demand to rise 2.1 percent in 1996 and a further 1.4 percent in 1997, in response to increased economic growth (2.1 percent projected in 1996 and 1.6 percent in 1997) and presumed normal weather. Domestic crude oil production, on the other hand, is projected by DOE to decline in 1996 and 1997 by 1.03 percent and 5.74 percent, respectively, causing net imports of crude oil to increase in both years. Net crude oil imports as a share of total crude oil supply is forecast to be 47.3 percent in 1996 and 49.6 percent in 1997.

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About AREI UPDATES

AREI UPDATES is a periodic series that supplements and updates information in **Agricultural Resources and Environmental Indicators (AREI)**, USDA, ERS, AH-705, Dec. 1994. **UPDATES** report recent data from surveys of farm operators and others knowledgeable about changing agricultural resource use and conditions, with only minimal interpretation or analysis. Please contact the individual listed at the end of the text for additional information about the data in this **UPDATE**. If you would like to be added to the mailing list or have other questions about **AREI UPDATES** or **AREI**, contact Richard Magleby, (202) 219-0436. [rmagleby@econ.ag.gov]

Table 1—Fuel purchased for farm use, 1974-95¹

Year	Gasoline	Diesel	LP gas
Billion gallons			
1974	3.7	2.6	1.4
1975	4.5	2.4	1.0
1976	3.9	2.8	1.2
1977	3.8	2.9	1.1
1978	3.6	3.2	1.3
1979	3.4	3.2	1.1
1980	3.0	3.2	1.1
1981	2.7	3.1	1.0
1982	2.4	2.9	1.1
1983	2.3	3.0	0.9
1984	2.1	3.0	0.9
1985	1.9	2.9	0.9
1986	1.7	2.9	0.7
1987	1.5	3.0	0.6
1988	1.6	2.8	0.6
1989	1.3	2.5	0.7
1990	1.5	2.7	0.6
1991	1.4	2.8	0.6
1992	1.6	3.1	0.9
1993	1.4	3.3	0.7
1994	1.4	3.5	0.9
1995	1.4	3.6	0.8

¹ Excludes Alaska & Hawaii and fuels used for household and personal business.

Source: USDA, ERS, based on data gathered by NASS.

Table 2—Average U.S. farm fuel prices, 1974-96

Year	Gasoline ^{1 2}	Diesel ^{2 3}	LP gas ²
Dollars per gallon, bulk delivery			
1974	0.47	0.37	0.30
1975	0.50	0.39	0.30
1976	0.53	0.41	0.33
1977	0.57	0.45	0.39
1978	0.60	0.46	0.40
1979	0.80	0.68	0.44
1980	1.15	0.99	0.62
1981	1.29	1.16	0.70
1982	1.23	1.11	0.71
1983	1.18	1.00	0.77
1984	1.16	1.00	0.76
1985	1.15	0.97	0.73
1986	0.74	0.58	0.55
1987	0.92	0.71	0.59
1988	0.93	0.73	0.59
1989	1.05	0.76	0.58
1990	1.17	0.95	0.83
1991	1.19	0.87	0.75
1992	1.15	0.82	0.72
1993	1.14	0.82	0.78
1994	1.08	0.77	0.72
1995	1.11	0.77	0.73
1996 (April)	1.26	0.92	0.80
Prices paid index (1990-92 = 100)			
1996			
January	82	91	95
April	105	105	106
July	98	79	99

¹Leaded regular gasoline survey item discontinued after 1992, and unleaded gasoline survey item added January 1993.

²Includes Federal, State and local taxes.

³Excludes Federal excise tax.

Source: USDA, ERS, based on data from NASS surveys of farm supply dealers.

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Table 3—Farm fuel expenditures, 1980-95

Year	Gasoline	Diesel	LP gas	Other	Total fuel	Fuel share of farm production expense
	-----\$billion-----					Percent
1980	3.31	3.12	0.67	0.82	7.92	5.9
1981	3.36	3.35	0.70	0.81	8.22	6.2
1982	2.87	3.25	0.76	0.85	7.73	5.9
1983	2.64	3.15	0.66	0.89	7.34	5.6
1984	2.40	3.06	0.72	0.82	7.00	5.4
1985	2.16	2.92	0.69	0.68	6.45	5.1
1986	1.51	2.04	0.49	0.65	4.33	4.1
1987	1.37	2.13	0.38	0.47	4.35	3.9
1988	1.42	2.12	0.38	0.53	4.45	3.8
1989	1.44	2.12	0.38	0.51	4.45	3.6
1990	1.65	2.42	0.53	0.57	5.14	3.9
1991	1.50	2.34	0.44	0.65	4.93	3.8
1992	1.72	2.65	0.65	0.63	5.65	3.9
1993	1.58	2.69	0.58	0.67	5.52	3.6
1994	1.50	2.70	0.62	0.73	5.55	3.5
1995	1.60	2.80	0.56	0.79	5.74	3.3

Source: USDA, ERS, based on NASS data.

Table 4—U.S. petroleum consumption and supply, 1992-97

Item	1992	1993	1994	1995	Forecast	
					1996	1997
Consumption:						
	Million barrels/day					
Motor gasoline	7.27	7.48	7.60	7.79	7.89	8.07
Distillate fuel ¹	2.98	3.04	3.16	3.21	3.29	3.33
Residual fuel	1.09	1.08	1.02	0.85	0.87	0.90
Other petroleum ²	5.66	5.64	5.94	5.87	6.04	6.05
Total	17.01	17.20	17.70	17.70	18.10	18.35
Supply:						
Production ³	10.04	9.73	9.67	9.67	9.57	9.02
Net imports (includes SPR) ⁴	6.90	7.62	8.05	7.89	8.55	9.11
Net stock withdrawals	0.07	-0.05	0.00	0.15	-0.30	0.23
Total	17.01	17.20	17.70	17.70	18.10	18.36
Percent						
Net imports as a share of total supply	40.56	44.19	45.13	44.55	47.26	49.61
Percentage change from previous year						
Consumption		1.35	2.61	0.50	2.08	1.43
Production		-2.58	-0.81	0.00	-1.03	-5.47
Net imports		10.43	4.85	-1.98	8.36	6.59

¹Includes diesel and fuel oils.

²Includes crude oil product supplied, natural gas liquids, other hydrocarbons and alcohol, and jet fuels.

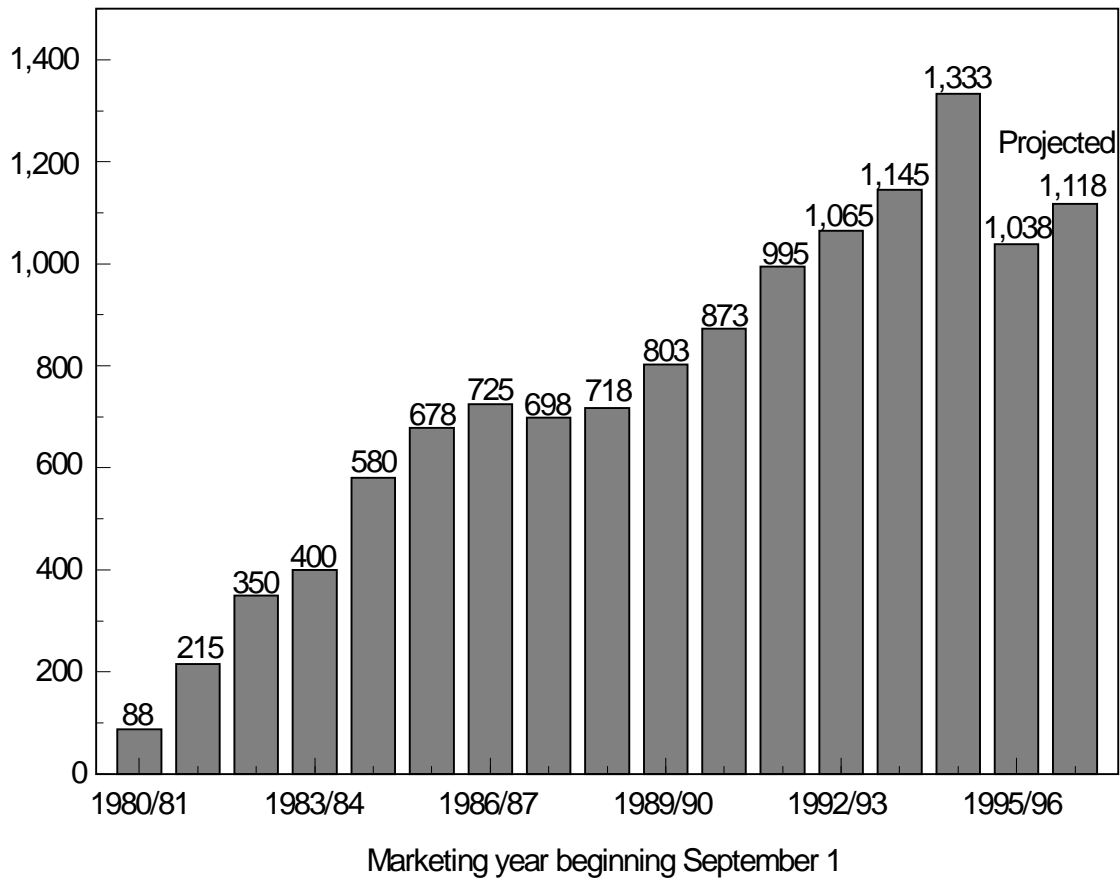
³Includes domestic oil production, natural gas liquids, and other domestic processing gains (i.e., volumetric gain in refinery cracking and distillation process).

⁴Includes both crude oil and refined products. SPR denotes the Strategic Petroleum Reserves.

Source: U.S. Department of Energy, Energy Administration, Short-Term Energy Outlook, DOE/ EIA-0202(96/3Q), August 1996.

U. S. ethanol production

Million gallons



Source: USDA, ERS, based on U.S. Dept. of Commerce data from the Census of Manufacturers.

AREI UPDATES

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